

# BAKER. (H.B.)

ADDRESS IN STATE MEDICINE.

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## Recent Advances in State Medicine.

BY

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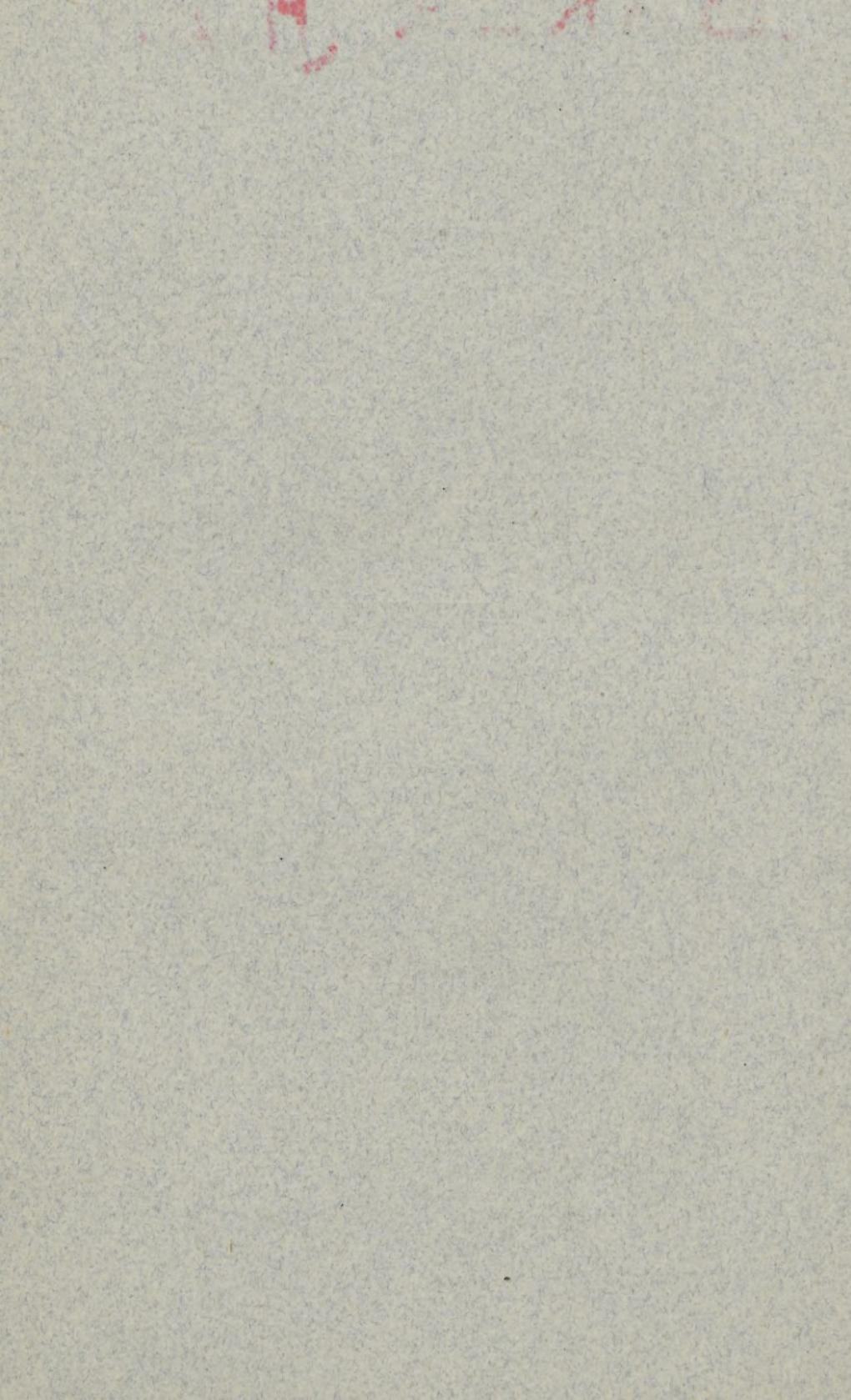
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## ADDRESS IN STATE MEDICINE.

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### RECENT ADVANCES IN STATE MEDICINE.

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The By-laws of this Association require that "The Chairman of each Section shall prepare an address on the recent advancement in the Branches belonging to his Section." Thus the subject of this address is fixed; yet, most of us are too busily occupied with professional or official duties to study carefully all of such work reported in all parts of the world, especially as the field in State Medicine is so very extensive, depending upon, and utilizing, as it does, the progress in most of the medical and allied sciences. One must have a very broad view, much leisure, a good knowledge of several languages, and be familiar with the requirements of practical sanitary work, in order to summarize fully the "recent advancement in the Branches belonging to" this Section. I cannot hope to accomplish so much, and, if I could, you could not listen to it in forty minutes.<sup>1</sup> but I shall do the best I can in the time at my disposal to place before the Section a summary of those recent advances in State Medicine which have attracted my attention and have impressed me as useful for our encouragement, for the suggestion of errors or obstructions to be avoided, or of new methods or combinations of facts useful for our progress.



## GENERAL PRINCIPLES UNDERLYING USEFULNESS OF STATE MEDICINE.

Sanitarians are not so much nuisance abaters as formerly were the hygienists; and they are more disease-preventers. In the public-health service generally, methods are coming to be more instructive, and less dogmatic and mandatory. Such opposition as that of Herbert Spencer, to boards of health constituted according to the old ideal, does not at all apply to State Boards of Health constituted on the modern plan which makes their chief functions the collection, collation and dissemination of facts which teach the causation of disease, the best means for avoiding and preventing sickness and deaths, and which facts are from sources so extensive as to be entirely beyond the reach of individuals, but which the people as a whole, through their governmental representatives, can easily collect, collate, and place before all classes of people, to be utilized by such as are sufficiently intelligent.

Modern methods of sanitation are thus in harmony with the law of "the survival of the fittest," if we consider, as I do, that the most intelligent classes, who obey the teachings of sanitary science are best fitted to survive.

Any narrow selfishness, however, which might be engendered in one of this most intelligent class, by dwelling upon the idea that "I am holier than thou," is soon dispelled when he comes to see that no man lives entirely to himself alone; not only is each person to some extent his brother's keeper, but he is dependent on all about him for immunity from dangerous communicable disease, and for safety of life and health in various ways.

The highest selfish interests thus join with the highest benevolence in favor of the widest possi-

ble diffusion of sanitary knowledge, and of the most complete obedience to sanitary precepts, ordinances and laws.

#### INCREASE OF THE PUBLIC-HEALTH SERVICE, AND OF SANITARY PUBLICATIONS.

An important factor in sanitary progress is the increase in the number of persons who enter, more or less permanently, upon some branch of sanitary work. In many of our States such increase is very great. For instance, in Michigan when the State Board of Health was organized, in 1873, there was hardly an active local board of health in the State; very few local health officers were appointed; while for the year 1887-88 over thirteen hundred local health officers were appointed in the State, and many of them physicians who devote considerable time to the work.

The increase in the numbers of our people who live in the cities and villages, the improvements in plumbing and other sanitary appliances, the increasing tendency toward sanitary inspections of such appliances, with the increased number of health officers and sanitary officials, and the greatly increased public interest in sanitary affairs, has built up a class of sanitary and trade journals, which do much for sanitary progress. Many physicians are now or have been health officers. For this, and other reasons, the medical journals seem to contain an increasing proportion of literature bearing upon sanitary administration, and other branches of State Medicine.

But the most important factor tending to increase the demand for sanitary literature is the work of the boards of health themselves, and especially that part of their work which consists in spreading among the people, in popular pamphlet form, the existing knowledge applica-

ble to the restriction and prevention of the most dangerous diseases, including the relations of low ground-water and of contaminated water to typhoid fever, and similar information of immediate practical utility. This work is productive of immediate good in the reduction of the sickness and mortality from such dangerous diseases ; and it stimulates a general desire among the people for more knowledge on such vital subjects.

The apparent popular demand for sanitary literature is being met by several of the State Boards of Health, by the publication of a monthly journal which serves as the organ of the State Board which issues it, and as a convenient means of regular communication between the office of the Board and the health officers and others throughout the State who are interested in public-health work. Such a journal is now published in Minnesota, Maine, Pennsylvania, Tennessee, Ohio, Iowa, and perhaps other States. In some of the States the proceedings of the State Board are published quarterly, and distributed quite generally within the State.

#### ORGANIZATION.

The increased number of persons in the public-health service, with the growing general interest in their work, prompts organization for comparison of methods of work, for coöperation wherever practicable, and for the general promotion of sanitary affairs.

In some of the States this tendency has led to the formation of Sanitary Associations, consisting mostly of physicians and others of the leading thinking classes. The Ohio State Sanitary Association is a notable example ; but Associations have been formed in other States. The principle

involved is not quite the same as in the "Associations of Medical Officers of Health," in England and in the Province of Ontario; but inclines more toward the popularization of sanitary information and measures among the people generally than toward the advancement of the knowledge of the medical officers of health. The assumption (which is probably correct) seems to be that the medical officers of health are now in advance of the people, and do not, so much as the people generally, need to advance their knowledge of sanitary science or of sanitary administration. However, under the system of free and general distribution of the best that is known, by State Boards of Health, it would seem that the time is near, when, throughout this country Associations of medical officers of health need to be formed, for their own advancement, and for the best interests of sanitary progress.

In Michigan, and some other States, although local Sanitary Associations have been formed, sanitary conventions have, thus far, been the principal method of popularizing sanitary measures. The topics chosen have reference to the greatest apparent needs of the locality in which the convention is held, such, for instance, as the present methods of disposing of excreta and waste products, and the present source and condition of the water-supply of the city or village, including the exact relations of privy-vaults to wells in the principal business part, and the principal residence portion of the place, and the explanation of the best means for restricting the most dangerous communicable diseases.

These practical questions of vital importance can be so presented by members of State Boards of Health, by leading physicians, lawyers and ministers, and so impressed upon the people of

almost any community that thereafter much greater attention will be given to affairs which relate to the public health.

#### THE NATIONAL CONFERENCE OF STATE BOARDS OF HEALTH.

The increasing intelligence of the people is now tending to stimulate progress by those who aim to lead the people in State Medicine. The most notable organization of this nature within recent years is the Conference of State Boards of Health, a National Association of delegates from State Boards, but having international tendencies, as shown by the fact that it includes delegates from the Provinces of Canada. It has had its fifth annual meeting in Cincinnati, just preceding this meeting of the American Medical Association. It does not supplant the older American Public Health Association, which aims at the popularization of sanitation, and for the advancement of sanitary science, but its work differs from both these functions of the older Association, being largely concerned with the practical questions of official public-health work, and its membership is restricted to officers who represent those who can put in force the conclusions reached by the conference. It is a league which, to some extent, serves to unify the Public-health Service of the United States, and might be utilized in the same direction to a much greater extent by the United States Government, to supply the lamentable loss of our National Board of Health, or to coöperate with a National Bureau of Health, or with a National Board of Health, should the present Board, or a new one be granted an appropriation.

### LEGISLATION: LOCAL, STATE, NATIONAL.

Sanitary laws are commonly supposed to have two functions: if properly published and enforced, they are educational; and they may be enforced in cases where no other course will secure obedience to sanitary precepts. But sanitary laws have other functions. A new general principle of sanitation, before suggested, is important especially in connection with sanitary legislation. According to this general principle of action it would seem that for the interests of sanitary progress, the most important legislation is that which provides for the collection of facts, not only those upon which to base immediate action, but also those out of which to construct sanitary science, that which provides also for the comparison and study of those facts by persons especially qualified for that service, and for the publication of the results of such statistical and other researches for the benefit of all classes of people. The facts necessary for immediate action are as imperatively needed as is the knowledge of the location of a burning building, and for much the same reason—in order that the danger may at once be averted. And, as in the case of a dangerous communicable disease, life and health as well as property are at risk, any ordinary pecuniary interest of the individual should yield to the high moral duty to the public safety, and await recompense from the public. Therefore I agree with Dr. Rohé, our chairman last year, who said: “*The first requirement then in dealing with infectious diseases from a ‘State Medicine point of view’ is notification, and inasmuch as such notification will never be effected if voluntary, it must be made compulsory.*

“*The second requirement in restricting the prevalence of such diseases is the segregation of*

patients, and guarding healthy individuals except the immediate attendents, from contact with them.

"The third requirement is prompt and thorough disinfection, in other words, the absolute destruction of the infective properties of infectious matter, in whatever that may consist.

"I would therefore declare the watchwords, of the practical and progressive sanitarian in dealing with communicable diseases, to be these three : *Notification, Isolation, Disinfection.*"

There seems to be progress in the first essential (notification) in many parts of the country. In England the area of country coming under that law is increasing, and it is proposed by the local government board<sup>2</sup> to extend the system of compulsory notification, and perhaps to make the law general, although in that country there has been opposition by some of the medical profession. In Michigan notification of dangerous diseases is compulsory upon householders and physicians, and physicians are allowed a very small fee (ten cents) for each case reported. Only small-pox, diphtheria, and scarlet fever are specifically mentioned in the law, but several other diseases including typhoid fever, and rötheln, have been declared to be "diseases dangerous to the public health." Increasing attention to this subject is noticeable in Michigan, in Wisconsin<sup>3</sup>, in Minnesota, in Maine,<sup>3</sup> in Iowa,<sup>3</sup> in Indiana,<sup>4</sup> in Kentucky.<sup>4</sup> In New Hampshire, also, a law has been enacted requiring physicians to report all cases of diphtheria and scarlet fever to the local board of health.<sup>5</sup>

#### STATE LEGISLATION: PROTECTING THE PURITY OF INLAND WATERS.

The last general court of Massachusetts made

an appropriation of \$30,000 for the use of the State Board of Health in protecting the "purity of inland waters." "It was thought wise to begin with the largest and most important supplies." . . . "From time to time other water supplies have been examined in this exhaustive manner." . . . "Four rivers in the State have been systematically examined." The results of these examinations are given in the report of that State Board, made January, 1888. The Board has established an experiment station, to determine the amount of sewage that can, in that climate, be purified by application to different soils.

#### LEGISLATION : NATIONAL.

That the United States Government pays less attention to those highest earthly interests of its citizens—human health, and life itself—than other governments, and even less attention than it gives to the protection of the swine and other domestic animals, is a cause for regret and shame to all intelligent citizens, and especially to physicians, because their attention is so frequently called to the subject, and because they realize how much might be done for the prevention of epidemics, and, more especially, of the sickness and deaths from the most common causes.

As usual, there is now before Congress a bill for a National Health Service.

#### WHAT PREVENTS NATIONAL LEGISLATION IN THE INTERESTS OF PUBLIC HEALTH.

A brief review of some of the efforts of physicians and Associations may aid to a clearer understanding of the situation.

Fifteen years ago in this same City of Cincinnati, May 1, 1873, I listened to a report to the American Public Health Association made by C. C. Cox, M.D., LL.D., of Washington, on "The

Necessity for a National Sanitary Bureau." The report, and the "Bill to establish a Bureau of Sanitary Science" which had already been presented to the U. S. Senate, are published in Vol. I, pp. 522-532 of the Transactions of that Association.<sup>6</sup>

Dr. Cox said: "Regarding the continually increasing sanitary wants of our country . . . it occurred to me that our government should advance among the first to conserve the health of its population, and avert the disasters which menace it. With this view I prepared, in 1871, the plan of a National Bureau of Health. This was subsequently submitted, as you are aware, at a meeting of the sanitarians, representing the different sections of the country, assembled at New York, and endorsed by them in a series of commendatory resolutions."

After the reading of the report by Dr. Cox, the American Public Health Association adopted a resolution "that in the judgment of this Association, the establishment of a National Sanitary Bureau, with relations to the general government similar to those of the Bureaus of Agriculture and Education, is highly desirable as a means of promoting sanitary science and the protection of the public health."<sup>6</sup>

November 14, 1873, at the meeting of the American Public Health Association in New York, resolutions presented by myself were adopted,<sup>7</sup> favoring the project, and for the appointment of a committee representing, so far as practicable, each State in the Union, to memorialize Congress, and to coöperate with a similar committee or "section" of the American Medical Association. Through the belief of the President of the Health Association and others that the time was not fa-

vable, the effort was not vigorous, and it was unsuccessful at that time.

November, 1878, at a meeting of the American Public Health Association in Richmond, Va., I again presented resolutions outlining proposed duties of a permanent U. S. Health Commission, proposing a committee of the Association to memorialize Congress for the establishment of the Commission, and for the appointment of a standing committee on Public Health in each legislative branch of the U. S. Government. The yellow fever epidemic of that year emphasized the need for some action by our government. The Association committee was appointed, nearly every State being represented upon it. Dr. Billings, of Washington, was especially active. Hon. J. H. McGowan, a member of Congress from Michigan, was induced to confer with Dr. Billings, introduce a bill, and labor for its passage. The National Board of Health was thus established. For a few years it did excellent work, which was commended by the leading sanitary associations in this country. It had the respect and confidence of nearly every sanitary authority in this country; but, from the first, it had the determined opposition of a few who were in office and power in Washington, and who were eventually able to cripple and finally to defeat appropriations for it by Congress. The distinguished sanitarians who were its first members dropped out, and to-day the Board exists only in name.

In a recent number of the *New York Medical Journal* is an editorial entitled "The Marine Hospital Service and the Proposed National Bureau of Health," in which is an account of the arguments recently before a committee of Congress for and against the proposed legislation. The arguments for it were mainly by the President of

the National Conference of State Boards of Health, and by three ex-presidents of the American Public Health Association, a committee representing the principal sanitarians and sanitary organizations of this country. The only opponent mentioned was Dr. Hamilton, of the Marine Hospital Service, who "submitted a brief." The editorial says: "Under one form or another, the old National Board of Health has been sought to be revived on several occasions, and each time Dr. Hamilton has had to oppose the attempt almost single-handed."

Officers in the medical departments of the army and navy, on the other hand, have favored the National Board of Health or other public health legislation; but it is much easier to prevent than to obtain appropriations.

#### FOR WHAT PURPOSE ARE WE HERE?

In order to fulfil the duties assigned to me, I have studied again the apparent intention of the founders of this Section, and of those who have contributed to its maintenance. It would seem that there has been and is in the medical profession a profound desire to promote the general welfare by utilizing for the public good those vast stores of scientific and practical information gained by the medical profession, which, although not of much use in the *treatment* of disease, are capable of a much more important service in the *prevention* of disease. I think there is a growing belief that there is a higher plane than even the exalted one on which the medical practitioner has long stood, and that if quite a large proportion of the medical profession were employed and paid for their efforts for the prevention of disease, their relations to the people would be of the noblest kind. The methods which tend in this direction are

those which seem to have actuated the founders of this Section—those which favor the formation of State and other Boards of Health, and (as the name of the Section, "State Medicine," implies) build up the legal organizations, local, State, and National, through which only can the public reap the results of the progress in sanitary science.

But those of us who have watched the progress of this Section know that although the Section has almost uniformly held back from recommending specific legislation, sometimes even discouraged attempts at public health legislation, it has always favored that other essential to progress in this direction, the building up of a sound sanitary science for the use of the State, whenever the State shall become sufficiently intelligent to utilize it.

Nearly all the papers and discussions before this Section are expected to contribute to this scientific branch of our work; therefore, if numerous important lines of work in the sanitary sciences, during the past year, are not mentioned in this address, they are likely to be brought out during this meeting, especially those relating to the topics especially chosen, "Malaria and the Causation of Fevers." There has been considerable progress in the knowledge of the causation of fevers, but a satisfactory mention of the lines of work would take too much of the time allotted to this address.

#### DEVELOPMENT OF THE GERM THEORY OF DISEASE.

Progress seems to be in waves, and greatest along certain lines. Recently many have been engaged in investigation and experiment in developing the germ theory of disease. Great progress has been made, considering that it has been

largely the contributions of individuals; for as a rule those for whom this work is most valuable—the common people themselves—have not yet awakened to the importance of such work so as to demand of their representatives that it shall be maintained by the governments. The Imperial Government of Germany has wisely maintained the laboratory in which Dr. Koch's great contributions to science have been taught to large numbers from many countries. In this country the General Government has done little worthy of special notice, but individual officers, in several branches of the U. S. Service, have contributed much toward progress in this direction, notably Dr. Sternberg, of the Army Medical Department.

A writer in *Science*<sup>9</sup> has lately published results of an inquiry by circular, addressed to each of the medical schools in this country, asking questions concerning the germ theory, and what is being done about it. Replies were received from those colleges in which the greatest number of students is taught. He concludes that quite a number of bacteriological laboratories have been established in connection with our larger medical schools. They are under the charge of competent directors, and are places where original research is being carried on, and where students have an opportunity to familiarize themselves with the subject in a practical manner. American medical schools are thus doing their share in this research in this manner, and the endeavor to advance our knowledge of bacteria and their relation to disease.<sup>10</sup>

In Baltimore there is a well-equipped bacteriological laboratory under the direction of the Professor of Pathology of the Johns Hopkins University. In Brooklyn,<sup>11</sup> the Hoagland Laboratory—the gift of Dr. C. N. Hoagland—under the immediate supervision of that gentleman, who

provided the funds for the building and its equipment, "will supply all the facilities, both for students and for advanced investigators, which can be found in the best-equipped laboratories of Europe."<sup>11</sup>

In Missouri the Legislature has appropriated \$5,000 for "the creation of laboratories for bacteriological study and investigation, and for the culture of vaccine virus, in connection with the State University at Columbia."<sup>12</sup>

#### A STATE LABORATORY OF HYGIENE.

In Michigan, the Legislature has appropriated \$35,000 for the building and equipment, at the State University, of two laboratories, under one roof, one being a laboratory of hygiene. The building will be ready for occupancy next October. Dr. V. C. Vaughan, Member of the State Board of Health, and Professor of Hygiene in the University, is Director of the laboratory.

Prof. Vaughan's first Quarterly Report of work (the chemical laboratory being temporarily used) has been published by the Michigan State Board of Health,<sup>13</sup> and includes a history of important contributions to sanitary science. He has isolated the Eberth bacillus of typhoid from water believed to have caused that disease, he has caused a disease resembling typhoid by injecting these bacilli into an animal, and has caused a rise of body temperature in animals by injecting a ptomaine, formed by those bacilli, but sterilized before its use. Dr. Vaughan has been able to find these bacilli in the air of a house-drain into which discharged a soil-pipe carrying discharges from a typhoid patient. He has made cultures of the bacilli there found. Other cases of typhoid fever had apparently been caused by the inhalation of air contaminated by emanations from that same house-drain.

#### A SPECIFIC CAUSE OF TYPHOID FEVER.

That filth alone will not cause typhoid fever, in the absence of the specific cause, is constantly becoming more evident. A notable instance is given by Dr. F. H. Blaxall, R.N., in the *London Practitioner*.<sup>14</sup> An outbreak of typhoid fever occurred among persons using water from a spring which, although known to be badly contaminated by excreta, had been used without causing typhoid fever for a period of fifteen years; yet soon after the arrival of cases of typhoid fever in the vicinity of the spring, 36 families were invaded, with some 80 cases of recognized typhoid fever, 8 proving fatal. All the persons attacked had drunk of the water from the spring. In this instance, the disease was not communicated from person to person, nor to persons who used the same water-closets as did those who had the fever.<sup>15</sup> This evidence is especially of importance as to the protection of the water supply from typhoid excreta, and of the disinfection of all excreta from typhoid patients.

#### BACTERIA AND SUMMER DIARRHŒA.

Results of experiments and bacteriological observations in summer diarrhoea have been published.<sup>16</sup> Many bacilli were studied, but one chief bacillus, which was found, somewhat resembled that of Asiatic cholera, but is shorter and thicker. Cultivation of bacilli from air from sewer ventilators showed some which resembled those found in the organs of persons dead from diarrhoea, but they were much slower in their growth. Those from the intestines developed rapidly, liquefied jelly became alkaline, and bacilli of the fifth generation emitted a powerful odor of decomposition. A very small dose of the artificially cultivated microbes produced a smart attack of diarrhoea.<sup>17</sup>

### ALBUMINURIA FROM SEWAGE POISONING.

Dr. George Johnson, in the *Brit. Med. Jour.*, March 13, 1888, "directs attention to the fact that among the many causes of blood contamination and consequent albuminuria, sewage poisoning is by no means an infrequent one."<sup>18</sup>

### BACTERIA IN CEREBRO-SPINAL MENINGITIS.

Fränkel, Weichselbaum and others, in a series of cases of primary cerebro-spinal meningitis, have obtained pure cultivations of Fränkel's pneumococcus<sup>19</sup> which, I suppose, is the coccus first discovered by Dr. Sternberg, in his saliva, (*Micrococcus Pasteuri*, Sternberg), and which is fatal to rabbits, and has been found in pneumonia more frequently than other microorganisms. Weichselbaum has also described a new coccus in six cases of idiopathic cerebro-spinal meningitis.<sup>19</sup> Dr. F. Goldschmidt has reported the same microorganism in one case;<sup>19</sup> and Dr. Biggs, of New York, in one case, found a diplococcus probably identical with the one described by the other two observers.<sup>19</sup>

### THE SPECIFIC CONTAGIUM OF SCARLET FEVER.

That there is a specific contagium of scarlet fever is not doubted now, I suppose, by any intelligent physician; but just what that contagium is has not yet been satisfactorily proved. The results of Dr. Klein's investigations into the subject, in connection with the Hendon cow disease, supposed to be scarlet fever in the cow, have been strongly combated.<sup>20</sup>

Experiments by Dr. Edington, of Edinburgh, (made at the suggestion of Dr. Jamieson,) carried on with bacteria from the blood, organs, and skin in different stages of scarlet fever, revealed one bacillus constantly present in the blood before the third day of the fever, and in the desquamating

scales after the twenty-first day. This he concludes is the contagium of the disease.<sup>21</sup>

#### DIPHTHERIA IN MAN AND ANIMALS.

Dr. Turner's report to the Local Government Board,<sup>21</sup> in England, in 1887, collected what was known on the subject of diphtheria in animals. Instances were given of its spread in pigeons, in fowls, and afterwards to families of persons, among swine, horses, cats infected from man and man from cats, successful inoculation of cats, and the occurrence of diphtheria among shepherds after the disease had prevailed among sheep. Bacteriological studies of diphtheria have led Loeffler to conclude that the bacillus is different in the calf and in the fowl, and still different in man.<sup>22</sup> Such discrepancies remain for further investigation. Probably much knowledge, useful for the saving of human life, might soon be worked out if the people would maintain more workers in this field of investigation.

#### SUPPURATION ALWAYS DUE TO MICROORGANISMS.

##### A FUNCTION OF THE LEUCOCYTES.

Although migration of leucocytes occurs under a variety of conditions and circumstances, the general principle that suppuration is always due to the action of microorganisms seems to be established.<sup>23</sup>

A recent writer has said:<sup>23</sup> "There seems to be but little doubt that there exists a constant relation (as regards several of the infectious diseases certainly) between the amount of suppuration and the degree of immunity that different animals show to the respective diseases. The greater the emigration of leucocytes the greater is the insusceptibility, and *vice versa*, the leucocytes apparently destroying, or counteracting the effects of, the

microorganism. Suppuration thus comes to be a conservative process, protecting the system from the action or entrance of the microbes. Perhaps this is always its function."

At any rate, knowledge of the relations of the white corpuscles of the blood to the specific microorganisms of disease seems to be progressing.<sup>24</sup>

#### PERIOD OF INCUBATION.

Some experiments by Prof. Vaughan, of the Michigan State Board of Health, indicate that the length of the period of incubation of typhoid depends much upon the number of specific bacteria taken into the body, and whether or not a communicable disease shall be contracted may depend upon the quantity of the specific cause which gains entrance to the body.

#### DIAGNOSIS OF CHOLERA IN DOUBTFUL CASES.

Further evidence of the practicability of aiding the diagnosis of cholera in doubtful cases, by cultivations of the microorganisms from the intestines or the excreta, has been supplied by Drs. S. T. Armstrong and J. J. Kinyoun, of the U. S. Marine Hospital Service, and Drs. H. Biggs and T. Mitchell Prudden, of New York.<sup>25</sup>

#### CAN CHOLERA BACILLI REPRODUCE IN WATER OF NEW YORK BAY?

The salt water in New York Bay has been "Sterilized and inoculated with pure cultivation of the spirilla of Asiatic cholera and also of Finkler and Prior," by Dr. J. J. Kinyoun, of the U. S. Marine Hospital Service,<sup>26</sup> with the result that "These spirilla have not only been kept alive, but have also greatly increased in numbers."<sup>26</sup> The inference is published that "If dejecta from cholera patients should be thrown into the lower bay, cholera could gain a foothold on the contiguous shores

where every condition favorable to its development and propagation sometimes exist."<sup>26</sup> The temperature at which the cultivation was maintained is not reported; neither is the temperature of the water at the shore in the most dangerous season, but if there is a probability that such development can occur there, further experiments and observations of temperature will be awaited with great interest, because of the practical importance of the subject, for the safety of this country from cholera.

#### QUARANTINE.

There has apparently been great progress in keeping certain diseases out of this country by means which we yet call quarantine. Formerly yellow fever was so frequently introduced into New Orleans that many believed it was endemic there; and cholera was generally brought into this country whenever it was prevalent in Europe. Now both of these diseases are kept out. The great money losses to trade in New Orleans have tended to aid sanitarians in perfecting the quarantine at that point. Under the able leadership of that brilliant sanitarian, Dr. Joseph Holt, the quarantine at New Orleans has been brought to a high state of perfection. Perhaps the best evidence of the possibility of general progress, however, is the general criticism of what has heretofore received no attention. As an offset to the criticism of the quarantine system at New York, it should be noted that during the last year that port of New York has been tried—cholera was brought to it, and, so far as is now known, it was not allowed to gain a lodgment. Aside from speaking well of a bridge that allows one to cross in safety, there are other considerations which should make us slow in trying to displace State or local quarantines; there are vast State and local

interests in trade and travel which should join with the interests of public health in building up and improving local quarantine administration. Thus far, the United States Congress has not exhibited such a steadfast purpose to guard the lives of the people as to inspire confidence in the United States Government as the best and only protector of the lives and health of the American citizens. Just now there seems to be those who urge that the National Government shall gain control of *all* quarantine. Without considering the constitutional objections, it seems to me that it will be much safer to hold fast to that which we have, at least until such time as the National Government shall demonstrate its ability to do as well. What is really needed is that the local quarantines shall be perfected ; that the National Government shall *add* its best services to those of the States and localities ;<sup>27</sup> and that those other dangerous communicable diseases, diphtheria, scarlet fever and typhoid fever, which cause much more sickness and deaths than do yellow fever and cholera, shall also be excluded by quarantine. If it be argued against this plan that those diseases are endemic, it may be replied that before its exclusion yellow fever appeared to be endemic ; and small-pox is still, yet we try to exclude it, and undoubtedly save thousands of lives thereby, and might exclude it almost entirely by more perfect methods.

#### YELLOW FEVER.

If, as reported, yellow fever is now present in Florida, there is cause for alarm which should lead to extraordinary efforts to limit that dread disease, because it is early in the season, there is no State Board of Health in Florida, and the inspection of travel, isolation of infected persons, disinfection of all infected articles—those measures

which constitute the new "quarantine"—are not easily enforced, and in inland places can be avoided by those familiar with the locality. Nevertheless, these measures are the most promising yet suggested.

#### SMALL-POX.

Since January 1, 1888, small-pox has been reported in twenty-one States of this Union.<sup>28</sup> Small-pox is now reported in nine States as follows: Connecticut, California, Colorado, Illinois, Kentucky, New York, Minnesota, Pennsylvania and Wisconsin. Although small-pox is still (or was recently) present in nine States, it is not spreading, and it speaks highly for the utility of the public-health service generally throughout this country that although introduced into twenty-one States of the Union, small-pox has not been allowed to spread to any great extent, except in California, where its restriction, on account of the Chinese, was especially difficult.

#### CHOLERA SHOULD BE MADE A DISEASE OF THE PAST.

Dr. W. J. Simpson, Health Officer of Calcutta, has reviewed, in the *Indian Medical Gazette*, the evidence as to the influence of season, rain-fall, and water-supply upon cholera, accepting the evidence brought out by Dr. Payne<sup>29</sup> and elaborated by Dr. O'Brien,<sup>30</sup> that in Calcutta the cholera was greatly reduced by the improved water-supply, and the evidence collected by myself that it was greatly influenced by the rainfall,<sup>31</sup> and he has added much to the completeness of these converging lines of evidence. Dr. Simpson says: "In the common condition of polluted wells and tanks, and the habits of the people, we have an explanation of seasonal cholera prevalence in Calcutta, synchronous with cholera prevalence in

the neighborhood, while the increased scarcity of water in the town during the last five or six years, culminating in such expedients as underground tanks for collecting water which ought to reach at least the first floor of the houses, we have a fair explanation of the increased cholera prevalence of late years in Calcutta, out of proportion to the period between 1870 and 1880." Speaking of the effect of the rains, he says: "They purify the air, they wash the filth from the soil, they purify and give an abundant supply of water to the wells and tanks; but, in addition to these things, in the town they perform a most important function, they flush the drains." Dr. Simpson closes his forty pages with these words, "A study of the distribution, progress, and seasonal changes indicates that the chief factor is want of pure water."

Elsewhere I have suggested that "If the prevention of cholera in its home is so largely dependent upon the rainfall and upon a good water-supply, one direction is thus indicated for most successful efforts for its prevention in this country."<sup>32</sup>

Here I wish to suggest that, inasmuch as all the cholera throughout the world is derived from the small endemic area around Calcutta, the nations of the earth might well undertake an international work for doing away with that "chief factor" of cholera prevalence in the endemic home of cholera, namely, that "want of pure water." Two-thirds of the cholera mortality in Calcutta has once been stopped in that manner.<sup>33</sup> The inference is plain that the other third might be stopped by more thorough but similar means, and if in Calcutta then also in the area around Calcutta. The work would be difficult, partly because about Calcutta the ground-water is brackish,

but I believe the scheme is entirely practicable. It would be a noble mission to accomplish this, and, as an international work, it would "pay" in dollars and cents.

#### PURIFICATION OF WATER BY CHEMICALS.

Progress has been made in our knowledge of methods of improving public water-supplies. The practice of adding a minute quantity of alum to water in order to clarify it, is an old and very familiar one. Recently one method of applying it continuously to public water-supplies has been patented. Prof. Albert R. Leeds, of Hoboken, N. J., added alum, in the proportion of half a grain to a gallon of water, and found, with the precipitation of peaty matter, etc., a reduction of the bacteria to such an extent that whereas before precipitation it contained 8,100 colonies per cubic centimetre, after precipitation the supernatant water contained only 80 colonies. They were all the bacterium lineola, and by filtering this supernatant water through a double thickness of sterilized filter paper into a sterilized tube, he found no bacteria in the filtered water.<sup>34</sup> An interesting question is, whether or not the bacteria of typhoid fever would be removed by this same agent in a similar manner. Prof. Leeds suggests the addition, also, in certain cases, of lime or soda, or a minute amount of soluble iron salt, like ferric chloride, and its removal, together with the bacteria, by filtration.

#### VITAL STATISTICS.

Vital statistics supply an important basis for public-health work. We are dependent upon mortality statistics for our knowledge of what are the greatest dangers to life, and of what progress we are making in the prevention of deaths. Al-

though the importance of vital statistics is well known to sanitarians, it is not yet appreciated by the people generally; and the practical work with statistics is so difficult that comparatively few master the general principles. There are no journals or ready means of comparison of views among statisticians; therefore progress is slow, especially in laws for the collection of vital statistics. Yet there is progress toward the collection and the improvement of some statistics in this country. In Minnesota, Dr. Hewitt, Secretary of the State Board of Health, has within the past year effected considerable in this direction. In the Connecticut State Board of Health Bulletin for February, 1888, Dr. Lindsley, Superintendent of Vital Statistics, says: "For the first time since these monthly bulletins have been issued, reports have been received at this office from every town in the State." The last quarterly report of the Illinois State Board of Health says: "For the first time since the collection of vital statistics was begun, all the counties have made returns of births and deaths."

#### SICKNESS STATISTICS.

For some purposes, including those of immediate action for the restriction of dangerous diseases, reports of sickness are much more valuable than the reports of deaths. An account of the methods successfully employed for several years in Michigan was given before this Section last year. Those methods are being continued in Michigan, and the State Board of Health of Ohio has established methods somewhat similar, which promise very useful results.

#### THE ETIOLOGY OF DISEASES.

Sickness statistics are especially valuable in studying the causation of diseases. The sickness

is nearer than the deaths are to the time of the causation of the disease. The statistics of sickness and meteorology in Michigan have proved that most of the important diseases are controlled by conditions of the atmosphere. Even such diseases as small-pox and scarlet fever, due to specific causes, have close relations to the coldness and dryness of the air inhaled. This knowledge does not antagonize the importance of isolation and disinfection in such diseases, but it shows why these measures are especially important when the air is cold and dry; and, inasmuch as the virus of those diseases clings for a long time to infected articles, it explains why, unless disinfection is enforced at all times, these diseases tend to break out and spread during the cold seasons of the year. The explanation is found in the fact that nearly every one of the diseases of the throat and air-passages is increased after the inhalation of cold dry air. Communicable diseases which enter by way of the air-passages thus find at such times a most easy entrance. Consumption is found to follow the same law, increasing after the cold dry season of the year, and decreasing after the warm moist season.

It appears, therefore, that there has been great progress in our knowledge of the relations of sickness to meteorological conditions, so that, in Michigan at least, we are now able to say under what meteorological conditions each one of many of the most important diseases will increase or decrease in prevalence. The times, or at least the conditions of the rise and fall of the sickness from these diseases<sup>35</sup> can be predicted in advance with almost as much accuracy as can the recurrence of the seasons. This may seem to you like laying claim to one of the grandest of recent human achievements, but I think the statement is

strictly true, and this knowledge of the conditions tending to the occurrence of diseases, should aid us greatly in the adoption of measures for their prevention.

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<sup>1</sup> The time allowed. *Jour. Am. Med. Assoc.*, June 25, 1887, p. 715.

<sup>2</sup> Circular issued Dec. 5, 1887. Published in "City of York, Report on the Compulsory Notification of Infectious Diseases, York, Eng."

<sup>3</sup> Sanitary News, Jan. 28, 1888.

<sup>4</sup> Sanitary News, Feb. 4, 1888.

<sup>5</sup> Sanitary News, Feb. 11, 1888.

<sup>6</sup> Pub. Health : *Trans. of Am. Pub. Health Ass'n*, vol. II, p. 537.

<sup>7</sup> Page 543, vol. II, *Pub. Health : Trans. Am. Pub. Health Ass'n*.

<sup>8</sup> March 24, 1888.

<sup>9</sup> H. W. Conn, *Science*, March 16, 1888, pp. 123-6.

<sup>10</sup> *Science*, March 16, 1888, p. 125.

<sup>11</sup> Dr. Sternberg's Address, *Sanitary News*, vol. xi, p. 50.

<sup>12</sup> Dr. Homan, *Sanitary News*, January 28, 1888.

<sup>13</sup> Proceedings of the Mich. State Board of Health, January, 1888.

<sup>14</sup> August, 1887, pp. 157-160.

<sup>15</sup> *London Practitioner*, August, 1887, pp. 157-160.

<sup>16</sup> H. Tomkins, M.D., *London Lancet*, August 20, 1887, pp. 361-3. Abstract in *N. Y. Med Jour.*, October 1, 1887, p. 390.

<sup>17</sup> *London Lancet*, August 20, 1887, p. 363.

<sup>18</sup> *London Practitioner*, April, 1888, p. 287.

<sup>19</sup> *New York Med. Jour.*, March 17, 1888, p. 288.

<sup>20</sup> *British Med. Jour.*, August 20, 1887. *N. Y. Med. Jour.*, October 1, 1887, p. 390. *Science*, February 10, 1888, p. 67.

<sup>21</sup> *British Med. Jour.*, June 8, 1887. *N. Y. Med. Jour.*, October 1, 1887, p. 390. *N. Y. Med. Abstract*, July, 1887, pp. 251-5.

<sup>22</sup> Abstracted in *Brit. Med. Jour.*, August 20, 1887, pp. 416, 417, and briefly in *N. Y. Med. Jour.*, October 1, 1887, p. 390.

<sup>23</sup> *N. Y. Med. Jour.*, March 17, 1888, pp. 288, 289.

<sup>24</sup> *N. Y. Med. Abstract*, March, 1888, p. 56. Also Lectures by Prof. Ray Lankester, *Sanitary News*, Chicago, April 21, 1888.

<sup>25</sup> *N. Y. Med. Jour.*, Nov. 12, 1887, pp. 546-7 and 548-9.

<sup>26</sup> *Sanitary News*, Feb. 18, 1888, p. 188.

<sup>27</sup> There is now a bill before Congress to improve the National quarantine, which it is hoped may become a law. It has passed the U. S. Senate.

<sup>28</sup> Maine, Massachusetts, Rhode Island, Connecticut, New York, Pennsylvania, Delaware, Ohio, Kentucky, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Kansas, Colorado, California, North Carolina, Tennessee and Louisiana.

<sup>29</sup> Arthur J. Payne, M.D., Surgeon-Major, Health Officer of Calcutta. Report on Sanitary Measures in India in 1876-7, presented to Parliament, London, Eng., 1878, p. 118.

<sup>30</sup> J. O'Brien, M.D., Surgeon-Major, etc., Annual Rep. of Health Officer of Calcutta, 1884.

<sup>31</sup> *Trans. Am. Pub. Health Assoc.*, p. 165, vol. xi.

<sup>32</sup> *Trans. Am. Pub. Health Assoc.*, pp. 154-165, vol. xi.

<sup>33</sup> *Trans. Am. Pub. Health Assoc.*, vol. xi, p. 165. Also, Cholera Mortality in Calcutta, Simpson, p. 39.

<sup>34</sup> *The Medical News*, Phila., Sept. 3, 1887, p. 262.

<sup>35</sup> Influenza, tonsilitis, bronchitis, pneumonia, croup, diphtheria, scarlet fever, small-pox, consumption, remittent fever and typhoid fever. Tables and diagrams proving this, relative to some of these diseases, are published in *Trans. Int'l Med. Cong.*, Washington, D. C., 1887.





